

# Chetco Bar Post-Fire Assessment

## Historic or Natural Range of Variation Analysis

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As part of forest management and post-fire decision-making, an understanding of historic forest dynamics can be used to place context around any potential management actions. Prior to European settlement, natural disturbances were allowed to operate and the forests were not managed for timber production. Since European settlement, forests have been dramatically altered and managed for multiple purposes. A combination of timber harvest, fire exclusion, cattle grazing, mining, and other actions not present before have resulted in forest structure and dynamics much different than existed historically. One method to gage how far forests have departed from that historic dynamic is to examine the historic or natural range of variation (NRV) in the pre-settlement forests. This can be accomplished in several ways. Here we describe using the LANDFIRE biophysical settings (Bps), their reference conditions, and state-and-transition modeling to estimate the structural dynamics of pre-settlement forests in the watersheds impacted by the Chetco Bar fire of 2017, and focusing on those watersheds that cover the majority of the fire and that may be impacted by post-fire salvage logging: the Chetco River and Pistol River watersheds.

The LANDFIRE BpS models are essentially descriptions of historic ecosystems that were shaped by natural disturbances prior to timber harvest and fire exclusion as well as Native American management and fire use. State-and-transition models (such as VDDT and ST-Sim) are used to model the frequencies of 3-5 forest structural stages or s-classes for each BpS. BpS models can also be viewed as aggregations of finer resolution vegetation types and dynamics, but that all have similar vegetation and disturbance processes. For the BpS models in the Chetco Bar fire area, five s-classes have been used:

- Early Seral (A): early development after a stand-replacing disturbance
- Mid-Seral Closed (B): mid-development with high canopy cover (generally >40-50%)
- Mid-Seral Open (C): mid-development with lower canopy cover (generally <40-50%)
- Late-Seral Open (D): late-development with lower canopy cover (generally <40-50%)
- Late-Seral Closed (E): late-development with high canopy cover (generally >40-50%)

These s-classes are defined by their successional state and transitions between them are governed by disturbances, types of disturbances, and disturbance frequency. Disturbances can include fire, insect and disease, flooding, and wind. Fire and other disturbances can be of different severities.

NRV analysis was conducted on two watersheds within the Chetco Bar fire perimeter that encompass the majority of the fire area. Results include all BpS models that had at least 1% cover within the watershed, and show the modeled percentages of each of the five s-classes for each BpS.

### **Chetco River Watershed**

Table 1 details the results for this watershed, while Table 2 shows the same information but with similar BpS models aggregated.

Table 1. Chetco River Watershed NRV analysis. LANDFIRE RC (reference condition) is the modeled historic percentage of each structural class. Sum of percentages across five structural classes will sum to 100.

				Early Seral (A)	Mid-Seral Closed (B)	Mid-Seral Open (C)	Late-Seral Open (D)	Late-Seral Closed (E)
BpS Code	BpS Name	Acres	% Watershed	LANDFIRE RC	LANDFIRE RC	LANDFIRE RC	LANDFIRE RC	LANDFIRE RC
R#TAOAcO	Oregon Coastal Tanoak (Mediterranean California Mixed Evergreen Forest – Coastal)	175,704	78.0	10.0	10.0	50.0	25	5
210210	Klamath-Siskiyou Lower Montane Serpentine Mixed Conifer Woodland	16,735	7.4	15.0	5.0	15.0	55	10
210220	Klamath-Siskiyou Upper Montane Serpentine Mixed Conifer Woodland	13,265	5.9	15.0	5.0	15.0	55	10
R#MCONsw	Mixed Conifer – SW Oregon (Mediterranean California Mesic Mixed Conifer Forest and Woodland)	7,392	3.3	15.0	5.0	10.0	50	20
210150	California Coastal Redwood Forest	4,341	1.9	1.0	1.0	98.0	0	0
210310	California Montane Jeffrey Pine (-Ponderosa Pine) Woodland	2,490	1.1	15.0	5.0	30.0	45	5
		Total =	97.6					

Table 2. Chetco River Watershed NRV analysis – BpS aggregations. Same as in Table 1, but BpS models with similar vegetation and same LANDFIRE reference conditions aggregated.

				Early Seral (A)	Mid-Seral Closed (B)	Mid-Seral Open (C)	Late-Seral Open (D)	Late-Seral Closed (E)
BpS Code	BpS Name	Acres	% Watershed	LANDFIRE RC	LANDFIRE RC	LANDFIRE RC	LANDFIRE RC	LANDFIRE RC
R#TAOAcO	Oregon Coastal Tanoak (Mediterranean California Mixed Evergreen Forest – Coastal)	175,704	78.0	10.0	10.0	50.0	25	5
210210, 210220	Klamath-Siskiyou Lower/Upper Montane Serpentine Mixed Conifer Woodland	30,000	13.3	15.0	5.0	15.0	55	10
R#MCONsw	Mixed Conifer – SW Oregon (Mediterranean California Mesic Mixed Conifer Forest and Woodland)	7,392	3.3	15.0	5.0	10.0	50	20
210150	California Coastal Redwood Forest	4,341	1.9	1.0	1.0	98.0	0	0
210310	California Montane Jeffrey Pine (-Ponderosa Pine) Woodland	2,490	1.1	15.0	5.0	30.0	45	5
Total =			97.6					

The associated Excel file (“LANDFIRE\_NRV\_ChetoBarFire\_Watersheds\_10digit”) has more complete versions of Tables 1 and 2 above. That file includes columns for the recent run of the VDDT models to indicate variation around the mean. In those spreadsheets there are columns for the VDDT modeled mean, high (+2 standard deviations), and low (-2 standard deviations) ends of the range.

Figure 1 shows the BpS models within the Chetco River watershed. Minor BpS models that covered <1% of the watershed area (such as some riparian types) have been removed.

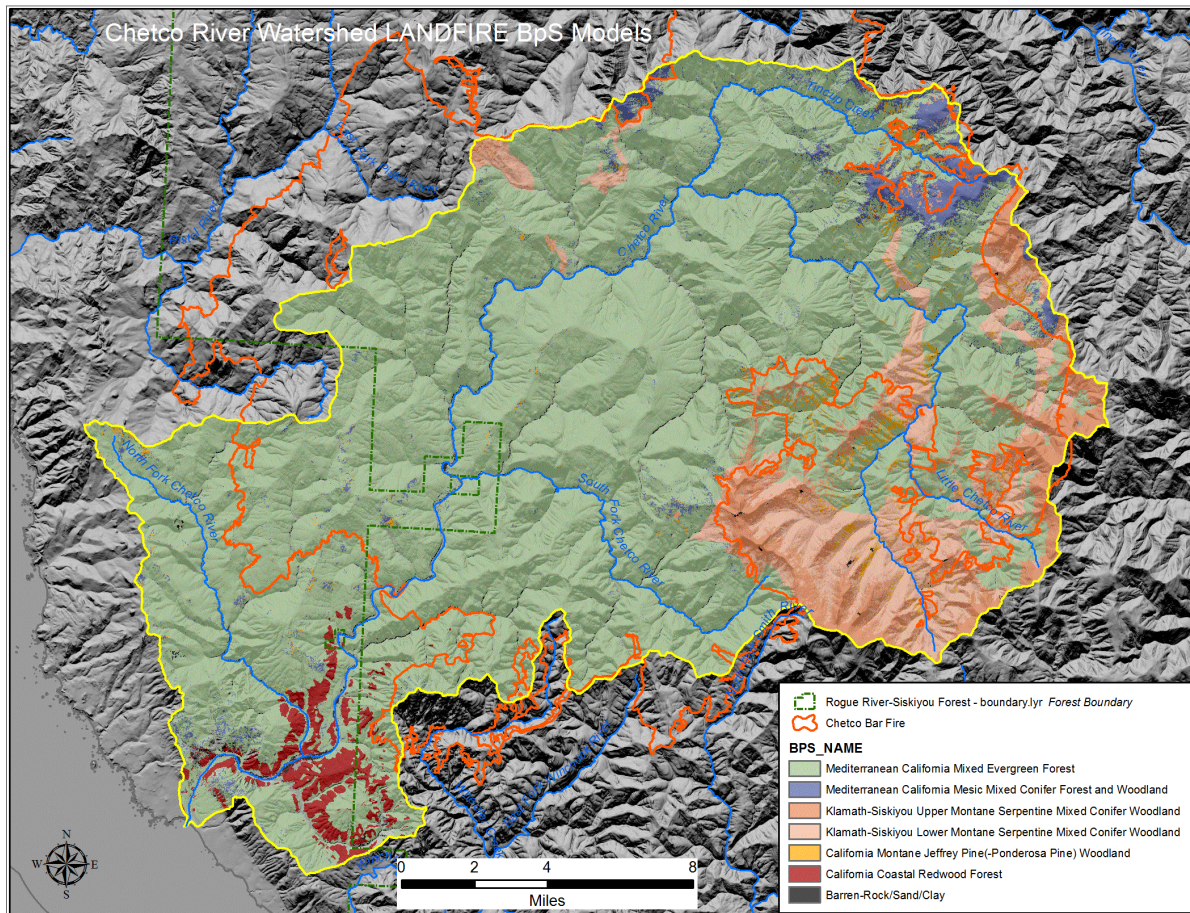


Figure 1: LANDFIRE BpS models within the Chetco River watershed.

### Pistol River Watershed

Table 3 details the results for this watershed, while Table 4 shows the same information but with similar BpS models aggregated.

Table 3. Pistol River Watershed NRV analysis. LANDFIRE RC (reference condition) is the modeled historic percentage of each structural class. Sum of percentages across five structural classes will sum to 100.

				Early Seral (A)	Mid-Seral Closed (B)	Mid-Seral Open (C)	Late-Seral Open (D)	Late-Seral Closed (E)
BpS Code	BpS Name	Acres	% Watershed	LANDFIRE RC	LANDFIRE RC	LANDFIRE RC	LANDFIRE RC	LANDFIRE RC
R#TAOAcO	Oregon Coastal Tanoak (Mediterranean California Mixed Evergreen Forest – Coastal)	58,454	86.2	10.0	10.0	50.0	25	5
210210	Klamath-Siskiyou Lower Montane Serpentine Mixed Conifer Woodland	4,105	6.1	15.0	5.0	15.0	55	10
R#MCONsw	Mixed Conifer – SW Oregon (Mediterranean California Mesic Mixed Conifer Forest and Woodland)	1,288	1.9	15.0	5.0	10.0	50	20
210220	Klamath-Siskiyou Upper Montane Serpentine Mixed Conifer Woodland	1,065	1.6	15.0	5.0	15.0	55	10
210360	North Pacific Hypermaritime Sitka Spruce Forest	988	1.5	5	10	1	10	74
		Total =	97.2					

Table 4. Pistol River Watershed NRV analysis – BpS aggregations. Same as in Table 1, but BpS models with similar vegetation and same LANDFIRE reference conditions aggregated.

				Early Seral (A)	Mid-Seral Closed (B)	Mid-Seral Open (C)	Late-Seral Open (D)	Late-Seral Closed (E)
BpS Code	BpS Name	Acres	% Watershed	LANDFIRE RC	LANDFIRE RC	LANDFIRE RC	LANDFIRE RC	LANDFIRE RC
R#TAOAcO	Oregon Coastal Tanoak (Mediterranean California Mixed Evergreen Forest – Coastal)	58,454	86.2	10.0	10.0	50.0	25	5
210210, 210220	Klamath-Siskiyou Lower/Upper Montane Serpentine Mixed Conifer Woodland	5,170	7.6	15.0	5.0	15.0	55	10
R#MCONsw	Mixed Conifer – SW Oregon (Mediterranean California Mesic Mixed Conifer Forest and Woodland)	1,288	1.9	15.0	5.0	10.0	50	20
210360	North Pacific Hypermaritime Sitka Spruce Forest	988	1.5	5	10	1	10	74
Total =			97.2					



The associated Excel file (“LANDFIRE\_NRV\_ChetoBarFire\_Watersheds\_10digit”) has more complete versions of Tables 3 and 4 above. That file includes columns for the recent run of the VDDT models to indicate variation around the mean. So there are columns for the VDDT modeled mean, high (+2 standard deviations), and low (-2 standard deviations) ends of the range.

Figure 2 shows the BpS models within the Pistol River watershed. Minor BpS models that covered <1% of the watershed area (such as some riparian types) have been removed.

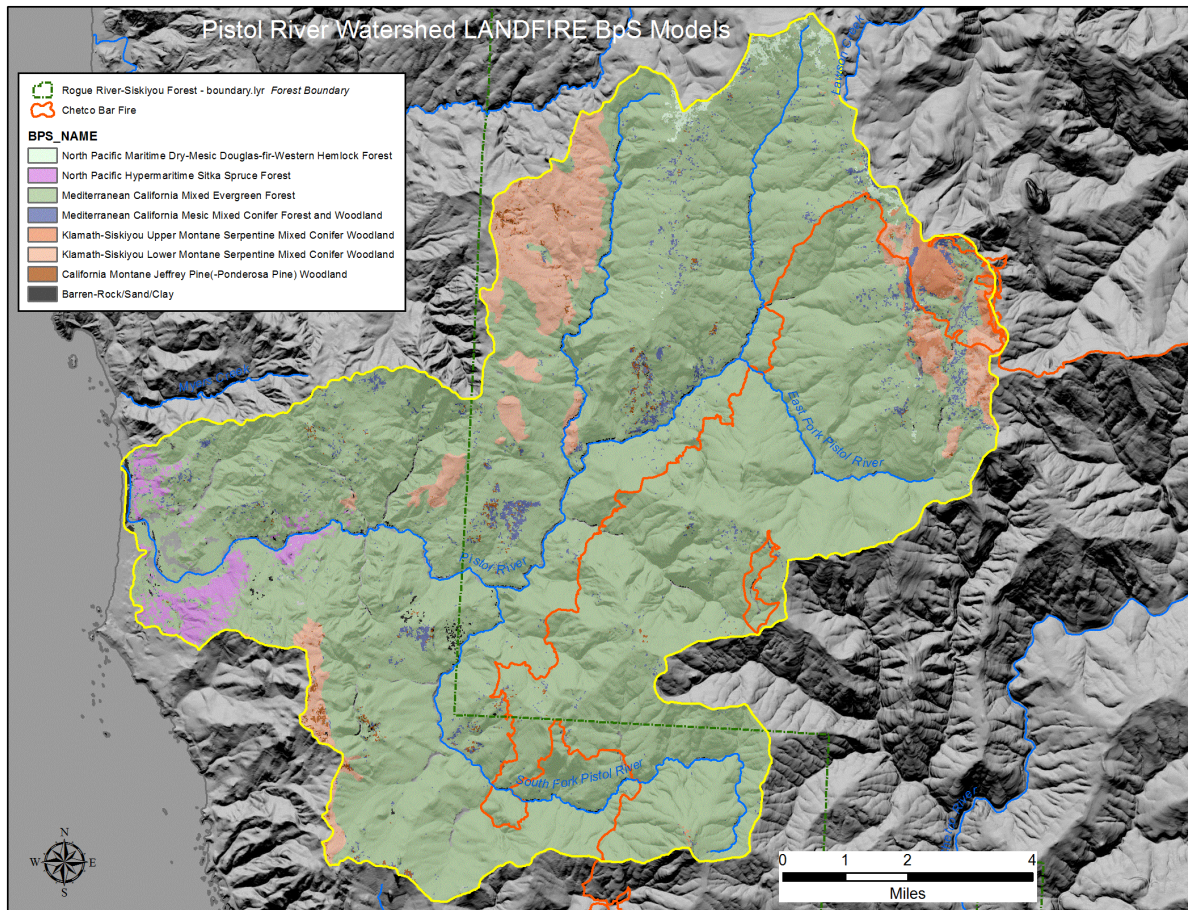


Figure 2: LANDFIRE BpS models within the Pistol River watershed.